Good-enough processing and how it depends on environmental noise — from adolescence into older age

Anna Laurinavichyute[1,2], Anastasiya Lopukhina[2], Svetlana Malyutina[2]

[1] University of Potsdam, [2] National Research University Higher School of Economics, Moscow

anna.laurinavichyute@uni-potsdam.de, alopukhina@hse.ru, smalyutina@hse.ru

Donnerstag, 05.03.2020 10:00–10:30 ESA1 O 121

When building sentence representations, readers can rely not only on the fully specified syntactic structure, but also on the semantic associations formed by typical event frames. That is, instead of engaging in potentially costly syntactic parsing, readers might guess the meaning of the sentence based on the set of words that constitute the sentence. The reliance on such good-enough processing increases when the input is processed in noisy conditions (Gibson et al. 2013), with the noise broadly defined as anything that disturbs or interferes with linguistic signal, be that actual noise, foreign accent, or perceived speaker characteristics. What is little known is whether readers of different ages are equally likely to rely on the good-enought processing, and whether this reliance is equally modulated by noisy conditions at every age. We know that older adults might adopt riskier reading strategies (Rayner et al. 2006), which might suggest higher reliance on the good-enough processing, however, little is known about adolescents.

To test whether the good-enough processing and its modulation by noisy conditions depends on age, we tested three groups of Russian-speaking participants: 51 adolescents (MAge = 15 (13–17); 14 females), 78 adults (MAge = 24 (20–39); 50 females), and 36 older adults (Mage = 65 (55–91), 25 females). They read 56 early- vs. late-closure sentences that were either semantically plausible or implausible, i.e., the syntactic structure either matched or contradicted the typical semantic relations. Half of the sentences were presented under visual distraction (noise) conditions: idioms and set expressions appeared in different parts of the screen simultaneously with words of the sentences appearing at the center of the screen. Each experimental sentence was accompanied by four or five random items of visual noise.

We analysed question response accuracies using Bayesian mixed-effects logistic regression. While adolescents performed on par with adults, older participants tended to make more errors ($p(\beta<0) = 0.97$). Participants of all ages gave more correct responses to plausible sentences, with both adolescents ($p(\beta<0) = 0.97$) and older participants being more sensitive to plausibility than adults. Sentences with high attachment received more correct responses, and conditions with visual noise received fewer correct responses independently of age or other parameters. To summarise, we found that while on average adolescents perform on par with adults and older participants give fewer correct responses, specifically in the semantically implausible conditions both adolescents and older adults are more susceptible to good-enough processing than adults. Importantly, we found no evidence that the tendency to engage in good-enough processing depends on visual noise at any age.

References: Gibson, E., Bergen, L., & Piantadosi, S. T. (2013). Rational integration of noisy evidence and prior semantic expectations in sentence interpretation. Proceedings of the National Academy of Sciences, 110(20), 8051–8056. Rayner, K., Reichle, E. D., Stroud, M. J., Williams, C. C., & Pollatsek, A. (2006). The effect of word frequency, word predictability, and font difficulty on the eye movements of young and older readers. Psychology and aging, 21(3), 448.